Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Redesignation of the 17.7-19.7 GHz Frequency	)	
Band, Blanket Licensing of Satellite Earth	)	**IB Docket No. 98-172**
Stations in the 17.7-20.2 GHz and 27.5-30.0	)	**RM-9005**
GHz Frequency Bands, and the Allocation of	)	**RM-9118**
Additional Spectrum in the 17.3-17.8 GHz and	)	
24.75-25.25 GHz Frequency Bands for	)	
Broadcast Satellite-Service Use	)	

COMMENTS OF THE INDEPENDENT CABLE & TELECOMMUNICATIONS ASSOCIATION

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SUMMARY

The *Notice* proposes a redesignation plan for the 17.7-19.7 GHz band that is based on flawed assumptions and unsupported by engineering data. The impetus for the redesignation proposal is the plans of non-government Fixed Satellite Service ("FSS") to ubiquitously deploy potentially millions of FSS earth stations. Determining that blanket licensing is necessary to ensure fast and efficient implementation of these satellite services, the *Notice* proposes redesignating the 17.7-19.7 GHz band. While recognizing that blanket-licensed satellite operators and terrestrial fixed service providers cannot function on a co-primary basis in the same spectrum band, the *Notice*, without considering the impact and without balancing the interests served by existing constituents in the affected spectrum, proposes to designate ubiquitously deployed satellite users as primary in the 18.3-18.55 GHz band; reduce private cable operators to secondary status in that same band; and move private cable operators to other parts of the 18 GHz band. But it is not that simple.

The private cable industry, composed of hundreds of small and medium sized firms throughout the United States, relies on the 18.142-18.580 GHz band to provide competitive video programming to subscribers. Contrary to the assumption in the *Notice*, the lower portion of the 18 GHz band is unworkable for private cable operations. And the other portions of the 18 GHz band proposed for terrestrial fixed use would not provide private cable operators with an adequate amount of spectrum to deploy the competitive cable services that they today deliver. In addition, the *Notice* incorrectly assumes that satellite users and incumbent private cable operators can share the 18.3-18.55 GHz band. With the number of incumbent private cable links that currently exist in this band, there is little, if any, available spectrum for satellite interests to

deploy blanket-licensed earth stations in populated areas. In short, the *Notice* fails to accommodate the interests of either private cable operators or satellite users in the 18 GHz band.

The rules adopted in this proceeding will shape the future competitive landscape in the MVPD marketplace. For the private cable industry to continue providing competitive cable services to local communities throughout the United States, private cable operators must have access to workable, vendor-supported spectrum. This means that the Commission cannot adopt the redesignation proposals outlined in the *Notice* without inflicting great harm. Instead, the Commission should embrace a redesignation plan that permits private cable operators to retain their primary status in the 18.142–18.580 GHz band and prohibits satellite use of the band. ICTA supports the carefully crafted band segmentation plan developed by the Fixed Point-to-Point Communications Section, Wireless Communications Division, of the Telecommunications Industry Association. This alternative plan will enable incumbent private cable operators to function alone in the 18.142-18.580 GHz band, which will permit the future growth of private cable services, and provide satellite users with spectrum to ensure efficient implementation of their Ka-band services.

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To: The Commission

COMMENTS OF THE INDEPENDENT CABLE & TELECOMMUNICATIONS ASSOCIATION

The Independent Cable & Telecommunications Association ("ICTA") submits these comments to the Commission's Notice of Proposed Rulemaking ("*Notice*") in this proceeding, issued September 18, 1998. On behalf of thousands of private cable and telephony operators, their customers and equipment vendors, ICTA urges the Commission to abandon or substantially modify the *Notice's* proposed redesignation plans for the 17.7-19.7 GHz band. The band segmentation and sharing proposals outlined in the *Notice* would dislocate thousands of existing private cable systems and prevent millions of existing and potential subscribers throughout the United States from receiving competitive cable services.[1]

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[1] On November 5, 1998, ICTA filed an Emergency Request for Immediate Relief in this proceeding, asking the Commission to lift the proposed September 18, 1998 cut-off for terrestrial fixed co-primary designations in the 18.3-18.55 GHz band. ICTA urges the Commission to act on its emergency request as soon as possible.

INTRODUCTION

The Commission opened the 18 GHz band in 1991 for private cable use to encourage competition in the video distribution marketplace.[2] This allocation, as recognized by the Commission, furthered the public interest by providing an effective safeguard against potential market power abuse by incumbent cable systems that possess a disproportionate share of market power.[3] It also was ideal from a spectrum efficiency standpoint because CARS operators used the 18.142-18.580 GHz for similar purposes and, therefore, equipment was also available in this portion of the band.[4]

Since the Commission opened the 18 GHz band, private cable systems have become a growing competitive force in the multichannel video programming distribution ("MVPD") marketplace.[5] Today, the private cable industry is composed of approximately 2,300 small and medium sized private cable firms that serve approximately 1.75 million subscribers throughout the United States.[6] Private cable operators use the 18.142-18.580 GHz band to provide service to multiple dwelling units ("MDUs"), including high and low-rise apartment buildings, condominiums, cooperatives, planned unit developments, mobile home communities and colleges and universities. The service offered by private cable is generally equal to, or

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2 *See Amendment of Part 94 of the Commission's Rules to Permit Private Video Distribution Systems of Video Entertainment Access to the 18 GHz Ban,* Report & Order, 6 FCC Rcd 1270 (1991) ("*18 GHz R&O*").

3 *18 GHz Order*, 6 FCC Rcd at 1271. Private cable operators do not use private rights-of-way and, therefore, are not required to obtain a franchise before conducting operations. *See 18 GHz R&O,* 6 FCC Rcd at 1272 (clarifying that "electromagnetic radiation, in passing above, across or through a public right-of-way does not `use' that right-of-way within the meaning of [47 U.S.C.] 522(6)").

4 *18 GHz Order*, 6 FCC Rcd at 1271. Private cable operations are separate and distinct from cable television relay ("CARS") operations in this band. Private cable operators, unfortunately, do not have access to the 12.7-13.2 GHz band for CARS operations.

5 *See In the Matter of Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming, Fourth Annual Report*, CS Docket No. 91-141 (rel. Jan. 13, 1998) ("*Competition Report*"), ¶ 83.

6 *Competition Report*, ¶ 83.

greater than, the channel capacity provided by franchised "hardwired" cable operators and provided at extremely competitive rates.[7]

Private cable operators also are providing much needed competition in other communications sub-markets. Using microwave networks, private cable operators are able to bundle their video service offerings with local telephony, data, Internet access and other enhanced services. Thus, while the franchised cable companies have backed away from their promises to provide full service cable and telephone networks, and the incumbent local exchange carriers have largely abandoned their efforts to compete in the local MVPD markets, the private cable industry is moving forward toward the goal of providing facilities-based competition in every segment of the communications marketplace and one-stop shopping for consumers.

I. THE PROPOSED REDESIGNATION PLANS FAIL TO ACCOMMODATE THE FUTURE SPECTRUM REQUIREMENTS OF PRIVATE CABLE OPERATORS OR BLANKET-LICENSED SATELLITE USERS.

In an effort to accommodate the ever-expanding demands of satellite users and protect the interests of incumbent users, the *Notice* proposes two very similar redesignation plans (a "primary proposal" and a "modified proposal") for the 17.7-19.7 GHz band.[8] The *Notice* asks whether the proposals adequately meet the spectrum requirements of both terrestrial fixed service providers and new satellite interests.[9] Because both proposals would enable satellite users to blanket license a portion of the 18 GHz spectrum band currently used by private cable operators, the answer to this question, quite simply, is "No."[10] Despite the Commission's intention to

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7 *Competition Report*, ¶ *84*.

8 *See Notice*, ¶¶ 29, 34-35.

9 *Notice*, ¶ 34.

10 Satellite operators concede that sharing between FSS and FS is difficult, if not impossible. *See Opposition of Kastar Satellite Communications Corp., Kastarcom World Satellite, LLC and @Contact, LLC* (filed November 9, 1998) ("Both FSS and FS systems acknowledge that sharing between the two systems is problematic, if not impossible.").

accommodate the future needs of terrestrial fixed operators as well as the interests of satellite users, the band redesignation proposals in the *Notice* fail to protect the interests of either group and would cripple private cable's growth.[11]

A. THE PRIMARY PROPOSAL WOULD THWART ANY FUTURE PRIVATE CABLE EXPANSION IN THE 18 GHz BAND.

The primary redesignation plan would allocate the 18.3-18.55 GHz band for primary use by blanket-licensed GSO/FSS operators and grandfather existing private cable users in the band.[12] Under this proposal, private cable operators that file 18 GHz applications after September 18, 1998 would be reduced to secondary status.[13] Private cable licensees simply cannot operate a competitive cable service under such a scheme.

1. Private Cable Licensees Will Interfere With Blanket-Licensed GSO/FSS Operators and, Therefore, Will Be Unable To Operate In Their Current Spectrum Band.

Under the primary proposal, grandfathered private cable operators in the 18.3-18.55 GHz band would not be allowed to expand or enhance their current operations in any manner that might increase interference to blanket-licensed satellite earth stations.[14] In addition, private cable licensees that filed applications after September 18, 1998 would be required to accept interference from blanket-licensed satellite operations.[15] Also, post-September 18 private cable licensees that interfere with a blanket-licensed satellite earth station would be required to

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11 The *Notice* proposes a third and fourth plan, neither of which involve redesignating the 18 GHz band but rather propose to continue co-primary designations between GSO/FSS and fixed terrestrial users with alternative licensing schemes. *Notice*, ¶¶ 36-38. Because the third and fourth proposals also contemplate sharing between private cable operators and satellite users, which is unworkable, ICTA urges the Commission to reject these redesignation proposals for the reasons stated below.

12 *Notice*, ¶ 29.

13 *Notice*, ¶ 30.

14 *Notice*, ¶ 40.

15 *Notice*, ¶ 33.

discontinue their cable service to subscribers.[16] Because there is no viable method for private cable operations to protect from interfering with blanket licensed GSO/FSS users, private cable operators in any of these scenarios would be foreclosed from further growth or improved service that involves use of the 18 GHz frequencies.

The majority of private cable's links are and will be located in major urban markets where a large number of MDUs are located.[17] It is reasonable to expect that satellite operators will concentrate their services in these densely populated locations as well. As detailed in the attached engineering exhibit prepared by Hardin & Associates, Inc., any urban private cable system can cause interference to any urban GSO/FSS system within a 45-mile oblong zone of the private cable transmission site. Even though these zones are narrow, placement of several private cable links in one area could result in significant interference to potential interference-sensitive satellite receive systems. As a matter of practice, where private cable has been launched, its 18 GHz paths usually criss-cross and therefore saturate the urban market.

In addition, a blanket licensing scheme would give private cable operators no notice of earth station placement. It defies common sense that private cable operators could protect potentially tens of thousands of new earth stations, at unknown locations. Under these conditions, it would be virtually impossible for a private cable operators to design a non-interfering system with any certainty of success or longevity.

Consequently, private cable operators would not be able to expand existing, or deploy new, operations in any portion of its current spectrum band if blanket licensing were

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16 *Notice*, ¶ 40.

17 *See* Engineering Analysis prepared by Hardin & Associates, Inc. (attached) ("Hardin & Associates Engineering Analysis"), p. 4.

allowed.[18] In addition, non-grandfathered private cable licensees would undoubtedly cause satellite users interference and, therefore, would be required to discontinue their cable service to subscribers. These ills would severely harm the private cable industry and, thereby, stifle competition in the local multichannel video distribution marketplace, to the ultimate detriment of the American public.[19]

2. The *Notice's* Alternative Band Plans For Terrestrial Use Do Not Accommodate Private Cable's Needs.

Designating the 18.3-18.55 GHz band for satellite use would cause private cable operators to lose the entire 450 MHz of contiguous spectrum (18.142-18.580 GHz) they currently employ in the 18 GHz band. Indeed, the proposal would deprive private cable and its subscribers of not only part of the 18 GHz spectrum band, but, as a practical matter, all of it. Without use of the 18.3-18.55 GHz band due to blanket-licensed satellite operations, the remaining pieces of private cable's existing spectrum band – 160 MHz (18.14-18.3 GHz) and 30 MHz (18.55-18.58) – have little or no value to private cable operators.[20]

In order to accommodate this dislocation of private cable operators, the *Notice* proposes to dedicate (i) the 17.7-18.3 GHz band for primary use by all terrestrial fixed operators, (ii) the 18.55-18.8 GHz band for co-primary use by non-blanket-licensed GSO/FSS and terrestrial fixed operators, and (iii) the 19.3-19.7 GHz band for co-primary use by Mobile

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18 The Commission recognizes that "blanket licensing would make it impractical for terrestrial fixed service pronders to coordinate new operations to and interference in shared frequency bands where blanket licensing is allowed." *Notice*, ¶ 19.

19 *See* Section III below.

20 With spectrum from 18.14-18.3 GHz, private cable could broadcast, at most, 26 channels. With spectrum from 18.55-18.58GHz, private cable could broadcast, at most, 5 channels. These non-contiguous spectrum allocations are certainly insufficient to enable private cable to be competitive with franchised operators.

Satellite Service Feeder Link ("MSS/FL") and terrestrial fixed service operators. However, these bands fail in any respect to accommodate the spectrum needs of private cable.

a) The 600 MHz Between 17.7-18.3 GHz Is Not Viable For Private Cable Use.

The assumption that the 17.7-18.3 GHz band provides a viable alternative for the private cable industry is fundamentally flawed. *First*, one-third of the band (17.7-18.14 GHz) is not eligible for video use under the Commission's rules and also is not vendor-supported. Although the Commission could adopt a video channelization scheme for the band, such a plan could take months, if not years, to work through. In addition, even assuming the Commission established a video channelization plan for the 17.7-18.14 GHz spectrum band, there is currently no vendor support in the band. Based on a survey of equipment manufacturers, it would take at least one year, and many hundreds of thousands of dollars in research and development costs, to develop the necessary transmission radios.[21] Private cable operators also would need to obtain approval from the Commission before using the equipment, build parallel and duplicate transmitters for already developed network hubs, and conduct tests on tower capacity, which would take additional time. All of these formidable challenges effectively inhibit private cable's use of the 17.7-18.14 band, but they are not the worst of the challenges.

Second, even assuming the Commission adopted various rules to make the 17.7-18.14 GHz band theoretically suitable, the band is unduly congested, and, therefore, a poor substitute. Currently, the 17.7-18.14 GHz band is used by a panapoly of fixed terrestrial service providers, including electric, gas and water utilities, public safety agencies, traffic control systems, railroad companies and broadcast stations. In addition, the *Notice* proposes to include

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[21] Equipment used by private cable operators in the 18.142-18.580 GHz band cannot simply be re-tuned for alternative bands. Rather, based on information from potential vendors, to function in 17.7-18.14 GHz band, private cable's present equipment would have to be completely redesigned.

broadcast auxiliary downlinks in the 17.7-17.8 GHz band, which would cause further congestion.[22] Thus, there is little, if any, room in the 17.7-18.14 GHz band to support the spectrum needs of private cable operators, and that is likely to be particularly true in the heavily populated areas where private cable operations predominate.[23]

Third, although the 18.14-18.3 GHz band is video channelized and vendor supported, this band, which represents only a fraction of private cable's current spectrum, cannot absorb private cable's need for 450 MHz of contiguous spectrum to offer a competing video service.[24] Contrary to the Commission's assumption in the *Notice*, private cable operators are full-scale providers of video programming: to be competitive they must be able to offer up to 70 channels of cable programming or more.[25] Indeed, private cable systems are often obligated by their contracts with MDU owners and ownership associations to provide as much programming as franchised cable operators do. To fulfill this obligation and deploy a competitive cable service to homes across the United States, private cable operators need at least 440 MHz of contiguous spectrum.[26] Thus, the 160 MHz from 18.14-18.30 GHz is virtually useless without at least another 280 MHz of workable, contiguous spectrum.

Fourth, the *Notice's* primary proposal would require private cable and other fixed terrestrial service providers to share the entire 17.7-18.3 GHz band, which, depending on the circumstances, would range from difficult to impossible. Currently, as the *Notice* recognizes,

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22 The *Notice* proposes to allocate the 17.7-17.78 GHz band for BSS services on a co-primary basis with fixed terrestrial users. But the *Notice* recognizes that ubiquitously deployed BSS earth stations cannot share with fixed terrestrial operators (*Notice*, ¶ 19); thus, allocating this 100 MHz to BSS would render the 17.7-17.8 GHz band useless for fixed terrestrial use and further crowd out fixed terrestrial use in the 17.8-18.14 band.

23 *See* Hardin & Associates Engineering Analysis, Exhibit 2 (studying the preclusive effects of existing terrestrial use in the Dallas market).

24 *Notice*, ¶ 27.

25 *Notice*, ¶ 27, n. 48.

26 *See Notice*, ¶ 27 (recognizing private cable's need for contiguous spectrum).

private cable and other terrestrial systems are licensed in separate parts of the 18 GHz band.[27] Despite its cursory treatment in the *Notice,* this separate allocation is critical. Most private cable operators use a "hub and spoke" configuration to serve two or more receiving stations at various azimuth angles. This type of configuration has difficulty coordinating with point-to-point bi-directional fixed services in a given geographic area.[28] Since other fixed terrestrial use would be extensive and elaborate, in many cases particularly in densely populated areas where private cable is centered, the potential for sharing between private cable and other terrestrial users is only theoretical.[29]

b) The 250 MHz Between 18.55-18.8 GHz And 400 MHz Between 19.3-19.7 GHz Also Is Unworkable For Private Cable.

The 250 MHz between 18.55-18.80 GHz and the 400 MHz between 19.3-19.7 GHz is plagued by similar problems. The *Notice* proposes to designate the 18.55-18.80 GHz band for co-primary use by non-blanket-licensed GSO/FSS and terrestrial fixed service.[30] However, only a mere 30 MHz (18.550-18.580 GHz) is video channelized and vendor supported and, therefore, available for private cable operators to use. The 19.3-19.7 GHz band suffers from the same problem. Also, both bands are heavily occupied by other users and, therefore, even if the band became video channelized and vendor supported, it would be largely unavailable for private cable use. Moreover, the proposals only offer private cable 250 MHz of contiguous spectrum (18.55-18.80 GHz) and 400 MHz of contiguous spectrum(19.3-19.7 GHz). As detailed above, private cable operators need at least 440 MHz to deploy a competitive service. Finally,

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27 The Commission recognizes that "due to the difficulties of coordinating these point-to-multipoint operations with typical point-to-point terrestrial fixed service operators, these services have generally been licensed in separate portions of the 17.7-19.7 GHz band." *Notice*, ¶ 27.

28 *See* Hardin & Associates Engineering Analysis, p. 4.

29 *See id.*

30 *Notice*, ¶¶ 29-30.

under current pfd and interference protection limits, private cable operators would have difficulty sharing with the gateway earth stations that would occupy the 18.55-18.80 GHz band on a co-primary basis.[31] They also would have difficulty sharing with MSS/FL operators in the 19.3-19.7 GHz band.[32]

For all these reasons, the proposal to satisfy the spectrum needs of private cable by designating the 17.7-18.3 GHz band for primary use by terrestrial fixed operators, the 18.55-18.80 GHz band for co-primary use by GSO/FSS and terrestrial fixed operators, and the 19.3-19.7 GHz band for MSS/FL and terrestrial fixed operators does not work. Because these bands fail to satisfy the spectrum requirements of private cable operators, and will prohibit them from providing new or expanded services, the primary redesignation plan should be rejected.[33]

B. THE PRIMARY PROPOSAL WOULD NOT SATISFY THE FUTURE SPECTRUM NEEDS OF GSO/FSS SATELLITE USERS.

The primary band redesignation plan not only fails to accommodate the spectrum requirements of private cable operators, it also fails to benefit the interests of GSO/FSS operators. Focused on the need to ensure fast and efficient implementation of new satellite services, the *Notice* assumes that grandfathering future terrestrial operations in the 18.3-18.55 GHz band would allow new satellite operators to effectively deploy blanket-licensed operations in that band.[34] But this assumption is flat wrong. Blanket-licensed satellite operations would have severe difficulty deploying blanket-licensed earth stations in the 18.3-18.55 GHz band even if existing private cable operators never installed another 18 GHz link in any market in the future.

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31 *See* Hardin & Associates Engineering Analysis, pp. 1-2.

32 *See id,* p. 4.

33 Outside of the 18 GHz band, private cable operators have no other available spectrum.

34 *Notice*, ¶ 27.

Because fixed satellite earth station receivers are extremely sensitive, they cannot tolerate terrestrial microwave in their vicinity.[35] Currently, grandfathered private cable operators have over 2,400 links in the 18.142-18.580 GHz band throughout the United States.[36] Because the configuration of most private cable links follows a hub and spoke architecture where a single transmit site will serve multiple receive sites, each link creates its own exclusion zone (that can extend as far as 45 miles from the cable transmit site) where satellite receivers will be unable to operate. Although the interference zones are relatively narrow, they criss-cross a large area, resulting in a large area of potential interference to satellite users. As the attached engineering analysis demonstrates, it would be virtually impossible for satellite users to protect existing private cable operations while at the same time ubiquitously deploying blanket-licensed earth stations.[37]

Hardin & Associates carefully analyzed the interference potential of private cable links on satellite operations in Dallas, Texas.[38] In Dallas, OpTel, Inc., the largest provider of private cable services, uses, through an intermediary, approximately 132 microwave links that run from 17 transmit sites. As the attached diagram of the Dallas market demonstrates, OpTel's links, representing roughly one-half of the licensed links in the market, create significant exclusion zones throughout the entire city Dallas where satellite users would receive unacceptable levels of interference.[39] The sheer magnitude of these zones renders satellite operations implausible in Dallas.[40] Satellite operators face similar problems in urban cities

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35 *See* Hardin & Associates Engineering Analysis, pp. 2-3.

36 Private cable operators have roughly 2,480 links in the 18.142-18.580 GHz band and over 40,000 frequencies. *See* Hardin & Associates Engineering Analysis, p. 1.

37 *See* Hardin & Associates Engineering Analysis, p. 3.

38 *See id.*

39 *Id.*, Exhibit 1.

40 The attached engineering analysis portrays the impact of OpTel's 132 links in Dallas, Texas. Assuming an antenna look angle of 65 degrees and backside attenuation at 180 degrees, the figure shows

throughout the United States.[41] Thus, even if private cable users do not expand their operations, the number of existing links licensed to private cable in these markets leave little space, if any, for satellite operators to effectively deploy blanket-licensed operations.

It is not surprising that the primary redesignation plan proposed in the *Notice,* which is devoid of engineering support, would fail to adequately accommodate the spectrum needs of the satellite interests it seeks to advance. For this reason alone, the Commission should reject the primary proposal. It would contravene the public interest for the Commission to adopt such a plan when it not only would fail to benefit the future needs of satellite users but also would significantly harm the present and future operations of private cable licensees.

C. THE MODIFIED PROPOSAL SIMILARLY WOULD FAIL TO ACCOMMODATE THE FUTURE SPECTRUM NEEDS OF PRIVATE CABLE OR SATELLITE OPERATORS.

The *Notice* also asks for comment on the merits of designating an additional 100 MHz at 18.3-18.4 GHz to be shared on a co-primary basis by GSO/FSS users and terrestrial fixed operators.[42] This slightly modified plan would give terrestrial fixed service operators 700 MHz of contiguous spectrum (17.7-18.4 GHz) but require them to share with GSO/FSS users.

For several reasons, this modified band segmentation plan is flawed. (1) Although it would enable private cable operators to have access to an additional 100 MHz of video channelized and vendor supported spectrum (18.142-18.4 GHz), the modified plan would still give private cable only 260 MHz of contiguous spectrum, leaving them with insufficient spectrum to deploy a competitive service. (2) The 17.7-18.4 GHz band suffers from the same

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an exclusion zone in which it would be impossible for satellite users to deploy operations. Significantly, this diagram covers only *one* operator in *one* market. If the other 130 or so links were also displayed, it is reasonable to expect the entire city would be excluded from satellite use.

[41] There are roughly 648 microwave links in New York; 293 microwave links in Los Angeles; 275 microwave links in Dallas; and another 216 microwave links in Chicago. *See* Hardin & Associates Engineering Analysis, p. 1.

[42] *Notice*, ¶ 35.

congestion problems that exist in the 17.7-18.3 GHz band and would require private cable operators and terrestrial fixed operators to share spectrum, which, as discussed above with respect to the primary proposal, is unworkable. (3) The proposal would require private cable to share with blanket-licensed GSO/FSS users, which would be virtually impossible.[43] Thus, the modified proposal similarly fails as a viable redesignation plan to accommodate the needs of either private cable operators or satellite users.

II. THE PROPOSED PRIMARY AND MODIFIED REDESIGNATION PLANS WOULD HARM INCUMBENT PRIVATE CABLE LICENSEES.

In its quest to respond to the future interests of satellite users, the *Notice* completely ignores the immediate impact of its proposal to allow blanket licensing in the 18.3-18.55 GHz band on incumbent private cable licensees.[44] Permitting blanket-licensed satellite operations in any portion of private cable's existing spectrum band (18.142-18.580 GHz) would prove devastating for incumbent private cable licensees. Although the redesignation proposal outlined in the *Notice* requires satellite users to protect the existing operations of grandfathered private cable systems in the 18.3-18.55 GHz band, the assumption underlying this proposal – that satellite users can blanket license the 18.3-18.55 GHz band while protecting existing users – is fundamentally flawed.[45]

Under the proposed power flux density values for GSO/FSS services in the 18.3-18.55 GHz band, grandfathered private cable operators would potentially suffer significant interference and serious performance degradation from GSO/FSS operations.[46] As the Commission is well aware, interference is based on the look angle of the satellite earth station.

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43 *Notice*, ¶ 35 ("However, if the 100 MHz at 18.3-18.4 GHz could be shared, terrestrial fixed service would have 700 MHz of contiguous spectrum.").

44 The *Notice* devotes only one paragraph (¶ 40) to the interests of incumbent 18 GHz users.

45 *Notice*, ¶ 40.

46 *See* Hardin & Associates Engineering Analysis, pp. 1-2.

This, in turn, depends on the position of the earth station and the position of the satellite.[47] In general, satellite users that employ antenna look angles that have an effective aperture gain of less than –31 dB will cause unacceptable interference to private cable transmissions.[48] In urban areas, where both private cable and GSO/FSS licensees will typically be located, satellite transmitters, which will be located on top of tall buildings with the receive antennas looking up, will likely have look angles of less than –31 dB and, therefore, will interfere with private cable's operations.

Hardin & Associates studied the severity of the interference potential that could result. As demonstrated in the attached analysis, satellite users could severely interfere with, and thereby unacceptably degrade, private cable's signals.[49] In addition, interference from satellite earth stations to private cable transmissions is extremely difficult to identify, locate and resolve. Although the *Notice* proposes that grandfathered private cable operators would receive interference protection from satellite operators, the use of blanket licensing makes coordination impossible when the location of satellite users is unknown.

The *Notice* appropriately recognizes the need to protect existing investment in terrestrial fixed operations, but its redesignation proposal would destroy that investment. It is simply wrong to assume that blanket-licensed satellite operators will not impact incumbent private cable operators. And it is unrealistic to conclude that satellite operators could somehow protect grandfathered private cable providers. Because blanket licensing would interfere with services provided by incumbent private cable licensees, the Commission should not designate the

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[47] For example, the look angle to an earth station located in Puerto Rico from satellites in geosynchronous orbit can vary from 3 degrees to 65 degrees based on the location of the satellite in the sky. *See* Hardin & Associates Engineering Analysis, p. 2.

[48] *See id.*

[49] *Id.* In addition, terrain scatter and the frequent 6 dB upfades that occur due to multipath conditions for in-phase reflections will increase the likelihood and magnitude of interference. *Id.*, p. 3.

18.3-18.55 GHz band, or any other portion of private cable's current spectrum band, for blanket-licensed GSO/FSS use, and should promptly reject the primary and modified proposals.

III. THE NOTICE IGNORES THE IMPACT OF ITS PROPOSED REDESIGNATION PLANS ON PRIVATE CABLE SERVICE AND COMPETITION IN THE MVPD MARKETPLACE.

The *Notice* utterly fails to appreciate the impact of its rules on the private cable industry and the competitive landscape in the MVPD marketplace. As described above, if blanket-licensed satellite users are permitted to deploy operations in spectrum currently occupied by incumbent private cable operators, non-grandfathered private cable licensees will be precluded from continuing their service to subscribers; incumbent private cable operators will likely suffer service interruptions; and all private cable operators will be prevented from providing new or expanded services. These consequences would have serious implications for private cable operators.

In any of these circumstances, private cable operators would be unable to fulfill their contractual service obligations with MDU owners and promises to subscribers. This would destroy the goodwill private cable operators have work tirelessly to build since 1991.[50] If a private cable operator cannot perform as promised, that operator (indeed the industry) can lose its credibility among MDU owners and subscribers, rendering it virtually impossible to secure additional MDU projects in the future. In addition, these private cable operators could be subject to potential liability for service contracts that the new rules would prevent them from performing. Faced with these potential consequences, many small private cable operators could go out of business.

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[50] On average, private cable operators expend at least six months of time and effort and invest thousands of dollars with respect to each MDU from which they enlist business *before* filing an 18 GHz application. A significant aspect of this process is negotiating with MDU owners and subscribers about services that will be offered and can be offered in the future.

The prospect of this injury if the Commission adopted the primary or modified redesignation plans already has had an immediate negative impact on the private cable industry. No business can afford to spend thousands of dollars to build a private cable facility only to find, after service begins, that the facility must be turned off because it interferes with an undocumented earth station. And no business wants to face the risks associated with failing to perform its contractual obligations. As a result, many private cable operators are reluctant to consummate, much less negotiate, contracts with MDU owners, and radio suppliers have ceased manufacturing radios for use in the field. In short, the redesignation proposal amounts to a *de facto* freeze on the private cable industry.[51]

The harm the *Notice* is causing and would cause the private cable industry is incalculable. It would similarly devastate competition in the MVPD marketplace. As the Commission and Congress recently emphasized, local video programming markets remain highly concentrated and characterized by substantial barriers to entry by potential MVPDs.[52] Private cable operators serve about 1.6 percent of the local market for the delivery of video programming, while incumbent franchised cable operators control roughly 87 percent.[53] Given franchised cable operators' continued dominance in the video services market, private cable has a critical function in bringing competition to local multichannel video programming delivery

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[51] For these reasons, ICTA filed an Emergency Request for Immediate Relief asking the Commission, at the very least, to lift the proposed September 18th cut-off date for co-primary designations in the 18.3-18.55 GHz band. *See* ICTA's Emergency Request for Immediate Relief filed November 5, 1998. ICTA incorporates the substance of its emergency request herein.

[52] *See Competition Report*, ¶ 126. Congress has clearly expressed an interest in more competition for cable. *See e.g.*, Cable Rate Increases: Hearing Before the Senate Committee On Commerce, Science & Transportation, 105th Cong. (July 28, 1998); Video Competition: Multichannel Programming: Hearing on H.R. 2921 and H.R. 3210, Before the Subcommittee On Telecommunications, Trade & Consumer Protection of the House Committee On Commerce, 105th Cong. (Apr. 1, 1998).

[53] *Competition Report*, ¶ 128.

markets.[54] However, private cable will be unable to survive, much less provide effective competition to franchised cable operators, if either the primary or modified band redesignation proposals are adopted. ICTA urges the Commission to promptly reject both plans.

IV. THE COMMISSION SHOULD ADOPT A REDESIGNATION PLAN THAT RETAINS PRIVATE CABLE'S PRIMARY STATUS IN THE 18.142-18.580 GHZ BAND.

The *Notice* requests comment on alternative band plans that might best accommodate the spectrum needs of both terrestrial fixed service and FSS licensees. Because of the interference and coordination problems between private cable operators and both fixed terrestrial users and satellite interests, as well as the unworkable nature of other 18 GHz spectrum for private cable's needs, ICTA urges the Commission to adopt a redesignation plan that retains private cable's primary status in the 18.142-18.580 GHz band. Enabling private cable licensees to preserve their present and separate frequency allocation will serve the interests of all users in the 18 GHz band.

The Fixed Point-to-Point Section, Wireless Communications Division of the Telecommunications Industry Association ("Fixed-Point-to-Point Section") proposes a reasonable alternative redesignation plan. The Fixed Point-to-Point Section's modified plan proposes the following: (i) preserve the existing 17.7-18.14 and 19.26-19.76 GHz paired FS primary allocations; (ii) preserve the existing 18.142-18.580 GHz primary CARS allocation; (iii) grandfather incumbent licensees as primary in the paired 18.58-18.82 and 18.92-19.16 GHz FS allocation; (iv) allocate the 18.58-18.8 GHz band as primary for GSO/FSS gateways and ubiquitous blanket-licensed satellite receivers; (v) allocate the 18.8-19.26 GHz band as primary

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[54] *Competition Report*, ¶ 11 ("Incumbent franchised cable systems remain the primary distributors of multichannel video programming.").

for NGSO/FSS ubiquitous blanket-licensed receivers; and (vi) rechannelize the 17.7-18.14 and 19.26-19.7 GHz paired FS primary allocation.[55]

The redesignation plan crafted by the Fixed Point-to-Point Section complies with the principle that sharing between private cable and other operators is impractical and destructive. The plan also designates significant spectrum allocations for satellite systems in the 18 GHz band. Thus, the Fixed Point-to-Point Section's proposal would permit future growth of private cable and fixed terrestrial operations, protect incumbent operations and enable the different types of satellite services to be successfully implemented in the 18 GHz band. For these reasons, ICTA endorses the Fixed Point-to-Point Section's redesignation plan and urges the Commission to adopt it in this proceeding.

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[55] *See* Comments filed by the Fixed Point-to-Point Section, Wireless Communications Division of the Telecommunications Industry Association.

CONCLUSION

For the reasons stated herein, ICTA urges the Commission to reject the band redesignation proposals outlined in the *Notice* and adopt the redesignation plan proposed by the Fixed Point-to-Point Section, Wireless Communications Division of the Telecommunications Industry Association.

Respectfully Submitted,

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Engineering Statement in Support of Comments
NPRM IB docket No. 98-172
Redesignation of the 17.7-19.7 GHz Frequency Band

In the Notice of Proposed Rulemaking, IB Docket No. 98-172 the Commission is proposing to redesignate the 17.7-19.7 GHz band among the various allocated services in an effort to allow a more efficient sharing of the spectrum between terrestrial fixed services and ubiquitously deployed FSS earth stations. As part of this plan, the Commission is proposing to redesignate approximately 57% of the 18.14-18.58 GHz service known as CARS to a GSO/FSS primary service and to redesignate another 7% to a co-primary status between the two services. This redesignation of 64% of the CARS frequencies effectively eliminates the 18.14-18.58 GHz band as a viable bandwidth to accomplish the intended goals of the service. This will effectively cripple future usage of this band for CARS applications and results in a defacto freeze. This frequency band is the only band available to private cable operators ("PCO's") for this type of application and significantly reduces the PCO's ability to compete.

Background

The 18 GHz CARS frequency band is primarily used by PCO's to distribute analog television signals within a market, in a point to multi-point type architecture utilizing an amplitude modulated link ("AML"). In a given system, a transmission site will be established and analog cable RF signals will be delivered from an existing private cable system to a transmitter. An entire block of frequencies available on the cable will be upconverted to the 18 GHz frequency band and transmitted. At the receive site, a similar block conversion of the entire band back to cable frequencies will be performed in preparation for distribution. This type of architecture allows for the most spectrally efficient and economical means of transmitting multiple television channels on microwave frequencies. The existing allocated frequency band will allow for the transmission of up to 72 analog television channels at power levels as high as +55 dBW EIRP. According to a study provided by Micronet Communications, a frequency coordinator for the CARS systems, there are 2,480 licensed and proposed paths in the 18 GHz CARS band frequencies. The markets with the most paths are New York (648), Los Angeles (293), Dallas-Ft. Worth (275) and Chicago (216).

PCO's typically use 18 GHz CARS links to supply television programming to multiple dwelling units ("MDU's"). In order to justify the cost of installing the microwave equipment, multiple users must be served from a single link. An MDU, such as an apartment building, where a single microwave link can serve the entire building accomplishes the business goal. Therefore, this technology is most advantageous in urban markets where the potential MDU business is large.

Issues

The following issues are present with the Commission's current proposed redesignation scheme.

1. **The proposed downlink power flux density values for the GSO/FSS services in the 18.3-18.58 GHz band have the potential to cause significant interference to existing CARS AML links.**

The Commission is proposing a power flux density of –120 dBW/m^2/MHz averaged over any contiguous 40 MHz band segment and –118 dBW/m^2/MHz in any 1 MHz band. If we assume boresighted conditions between the satellite and the CARS receive antenna, this power flux density would create a noise level of –88.9 dBm in a 4 MHz bandwidth using a 40 dB gain receive antenna. If we also assume a typical CARS transmitter (Blonder Tongue TX18000 & PA18000) with a transmit antenna gain of 40 dB, the EIRP of the CARS transmit system will be 39.4 dBm. Assuming a 2 mile path, the resulting C/I caused by the satellite signal is approximately 41 dB. Since this is an analog AML link, 41 dB of C/I represents a significant degradation in picture quality and eliminates any fade margin for the link. In fact, current FCC regulations with regards to the minimum signal quality delivered to a subscriber based on carrier-to-noise is 43 dB (reference CFR47, Part 76.605(a)(7) of the Commission's Rules).

Since the GSO/FSS satellites can exist over a wide arc, the potential for achieving a boresighted condition can exist. Look angles from the CARS receive antennas to the satellites will vary significantly dependent on the location of the earth station in the country and the position of the satellite in orbit. Look angles can easily vary from 3 to 65 degrees. When you consider that most CARS systems are located in urban environments where the transmit antenna may reside on a tall building and the receive antennas are looking up, one can very easily achieve a tilt to the CARS receive antenna that will coincide with the look angle to a satellite. When this occurs, severe interference will occur as described previously.

An interference analysis was performed utilizing a theoretical CARS receive site whose geometry causes the satellite signal to enter the CARS receive antenna with no discrimination. Assuming a 4 MHz channel bandwidth and a receive antenna gain of 44.7 dB, the level of the signal received from the satellite at the output of the CARS antenna will be –117.2 dBW. The noise floor in a 4 MHz bandwidth will be –138 dBW. If we assume a CARS received signal level necessary to give 50 dB carrier-to-noise, the resultant desired signal will be –86 dBW. Therefore the carrier-to-interference ratio will be –86 dBW – (-117.2) dBW or 31 dB. This level of interference is severe and would represent a completely unusable signal for a CARS receive site.

Another way of looking at the potential for interference is described in the comments of the Fixed Wireless Communications Coalition and is reiterated here for emphasis. The private cable's per-channel (6 MHz) video distribution receivers have a 4 MHz noise bandwidth that results in a typical thermal noise floor of –108 dBm and operations of approximately 52 dB carrier to noise interference. Assuming private cable's analog video transmissions could accept a 1-dB degradation of C/N, the maximum interference power private cable's receivers could accept is –114 dBm. Taking into account the proposed maximum downlink PFD thresholds outlined in the NPRM (-120 dBW/m^2/MHz averaged over any contiguous 40 MHz band segment and -118 dBW/m^2/MHz in any 1 MHz band), a look angle of less than –31 dB will cause unacceptable interference.

2. **The potential for interference from existing and future terrestrial fixed service CARS systems operating in the 18.3 to 18.55 GHz frequency band to the proposed ubiquitously deployed GSO satellite receivers would be severe, thus eliminating this portion of the spectrum for future use by CARS.**

Because future CARS systems operating in this band would be secondary to the GSO satellite systems, all future CARS links would be required to protect GSO receivers. Since ubiquitously deployed GSO receive systems will (1) use small aperture antennas, (2) be

located anywhere and (3) be numerous, it will be virtually impossible for the CARS operator to protect all potential GSO receivers.

A CARS system has the potential to operate with as much as 316 KWatts (+55 dBW) of EIRP per current FCC rules. Although the rules allow use of this power level, current equipment available to the 18 GHz CARS industry places a limitation of approximately +30 dBW EIRP per RF channel. Using this EIRP, an interference zone can be determined for the area around a CARS transmit site where satellite receivers will not be capable of operation. The size of this zone will be determined by the EIRP and antenna pattern of the CARS system, the attenuation of the satellite antenna to the undesired CARS signal (discrimination) and the sensitivity of the satellite receiver. The discrimination of the satellite antenna is determined by the look angle to the satellite and the angle between the satellite receive antenna and the CARS transmit antenna. Both the azimuthal and elevational discrimination of the satellite antenna must be considered in the calculation of potential interference. However, the small aperture satellite receive antennas proposed for use in the ubiquitously deployed earth stations will have minimal discrimination capabilities. These small aperture antennas will therefore make it even more difficult for CARS links to give interference protection.

Attached as Exhibit 2 is a detailed technical analysis showing the calculation of the potential interference zone. If we assume interference to the satellite receive system is defined as a 1 dB degradation in the noise floor, a 2 foot diameter CARS transmit antenna, a typical satellite look angle and the +30 dBW EIRP for the CARS system; the length of the interference zone can extend as far as 45 miles from the CARS transmit site. Even though the width of the zones is narrow, placement of several CARS links around an area will result in a significant area of potential interference.

Also shown in Exhibit 1 is a diagram of the potential zone of interference for a single licensee in the Dallas, TX area. There are 132 links from 17 transmit sites shown in the diagram. This represents less than half of the licensed links in the Dallas area. As the diagram clearly shows, the potential exists for significant interference to future satellite receive systems from existing CARS systems. Because of the large area of potential interference from CARS links, it can be inferred from this same diagram that it would be virtually impossible for future CARS systems to protect the ubiquitously deployed satellite systems. Also, by using antenna discrimination based on a typical satellite location we are erring on the side of conservatism in the study. Since GSO proponents would expect protection over the full band of frequencies and the full arc of potential satellite locations, antenna discrimination will not be as powerful a tool for reducing interference as shown in this example. Therefore, the size of the interference zones could grow significantly larger than those shown in this example.

3. **The analysis submitted above and in Exhibit 1 does not take into account the increased interference potential to satellite receive systems based on terrain scatter of the CARS signals.**

The 18 GHz signals are of sufficiently small wavelength such that many objects will be effective reflectors of the CARS signals. Terrain, buildings and other manmade structures will reflect the CARS signals in a multitude of directions dependent on the angles of incidence. Therefore, the potential will exist for interference to be reflected into a satellite receive system. It is impossible to estimate the extent to which this interference could occur, since the shape, size and location of the buildings causing the scatter could be almost infinite.

4. **Relocating the CARS band to the 17.7-18.3 or 19.3-19.7 GHz band is not practical because the coordination process to add new CARS links in with existing FS links would be virtually impossible.**

   The quantity of existing FS links in the 17.7-18.3 and 19.3-19.7 GHz band is large, especially in the urban markets. The configuration on most CARS links follows the hub and spoke architecture, where a single transmit site will serve multiple receive sites. An interference zone can be created around a fixed service receive site showing the area of potential interference from a CARS installation. If we assume the CARS transmit antenna can be pointed at the fixed service receive site and operating with +30 dBW EIRP as was assumed in our previous example, an interference zone can be created. Attached as Exhibit 2 is a diagram showing the interference zone around each of the fixed service receive sites listed in the Dallas, TX area from the FCC on-line database, just for the 17.7-18.3 GHz band. From this diagram one can immediately see the preclusive effect of the existing fixed service stations.

   In addition, the NPRM is proposing to allow co-primary use of this band between MSS and FS links. The interference protection requirements of the MSS links will be preclusive in nature as describe in section 2. of this document, thereby causing additional limitations on the ability to license CARS links.

5. **Relocating the CARS band to a higher frequency spectrum is not practical given the sensitivity of the AML link and the need for reasonable path lengths.**

   For a typical CARS band link operating at +30 dBW EIRP and a 2 mile path length, the path reliability is approximately 99.9% with a fade margin of 20 dB. This level of performance is reasonable for an analog television system. However, moving this spectrum higher in frequency will begin to encroach on the margin and ultimately result in an unacceptable path length to accomplish the goals of the system.

6. **18 GHz CARS usage is currently most heavy in urban markets and future growth is expected to be in these same markets. Satellite services will be very extensive in these markets as well, further increasing the difficulty for CARS systems to protect satellite services.**

   Because of the high cost and limited range of the 18 GHz CARS signal, a majority of the links in use today are located in major urban markets. This trend is expected to continue with continued expansion in almost all major markets. Because of the population density in these markets, it is reasonable to expect the satellite services will concentrate here as well and make the implementation of future CARS systems virtually impossible.

7. **Placing the 30 MHz of spectrum located between 18.55-18.58 GHz in a co-primary status between GSO/FSS and FS renders this spectrum as ineffective as the 18.3-18.55 GHz band.**

   Because the CARS links operate in a block conversion mode, allowing 30 MHz of spectrum to exist at the top of the band does not alleviate the need for bandwidth. This spectrum is virtually useless without the full block of bandwidth available.

Statement of Engineer

This statement was prepared by George W. Harter, III, a consulting engineer with the firm of Hardin and Associates, Inc.. a professional engineering firm licensed in the state of Virginia and whose credentials are a matter of record with the Commission.

George W. Harter, III

November 18, 1998

Exhibit 1

The thermal noise floor can be calculated from:

$P_N = kTB$

where

P_N is the noise spectral density

k is Botzman's constant 1.38×10^{-23} Watts/K/Hz

T is the noise temperature which assumed at 293 K

B is Bandwidth

Assuming a 1 MHz reference bandwidth, the above equation gives a noise spectral density of –143.9 dBW/MHz. Assuming the criterion for non-interference to a satellite receiver is to limit the interfering signal such that it will cause no more than a 1 dB increase in the noise spectral density. In order to limit the noise spectral density increase to no more than 1 dB, the interfering signal level must be no more than –149.8 dBW/MHz.

The current FCC proposal would place GSO/FSS receivers ubiquitously throughout the country in the 18.3 to 18.55 GHz range. In footnote 26 of the NPRM, the Commission references applications filed and orbital locations assigned by thirteen applicants for GSO/FSS satellites. These assignments range from 173° east longitude to 148° west longitude.

Satellite look angles can vary dependent on the position of the earth station and the position of the satellite. The look angle to an earth station located in Puerto Rico from satellites in geosynchronous orbit can vary from 3 degrees to 65 degrees based on the location of the satellite in the sky. A geosynchronous satellite can cover approximately 162 degrees of the earth, centered at its position. The look angle as the earth station moves north does not vary as much as it would in Puerto Rico, however the look angle only varies from 2.3 degrees to 35 degrees when you consider an earth station located in Washington State. However, it was assumed that a typical look angle of 30 degrees would be reasonable. This would give a typical elevational antenna discrimination. Also an azimuth attenuation was taken at a discrimination angle of 4 degrees, which is looking just off of boresight to give a significant amount of attenuation. This gave an overall antenna discrimination of 62 dB. (At 2-FT earth station antenna was assumed.)

$$P_R = EIRP + G_E - D_E - D_A - 96.6 - 20\log(f) - 20\log(d)$$

where

P_R is the power received at the output of the antenna which is set to -149.8 dBW/MHz

$EIRP$ is the power output from the CARS antenna which is set to + 30 dBW or 22.2 dBW/MHz

G_E is the gain of the satellite antenna at boresight which is set to 45 dBi

D_E is the look angle attenuation of the satellite receive antenna which is approximately 40 dB at 30 degrees off of boresight

D_A is the azimuthal attenuation of the satellite receive antenna is approximately 22 dB at 4 degrees off of boresight

$-96.6 - 20\log(f) - 20\log(d)$ is free space path loss expression where the frequency is assumed at 18.4 GHz

Solving for distance utilizing +30 dBW, an exclusion zone can be created with a maximum distance of 45 miles. If antenna discrimination is reduced, the exclusion zone will significantly increase. The boundary has the characteristics of a typical CARS antenna. The following figure shows the exclusion zone for one licensee in the Dallas, TX area.

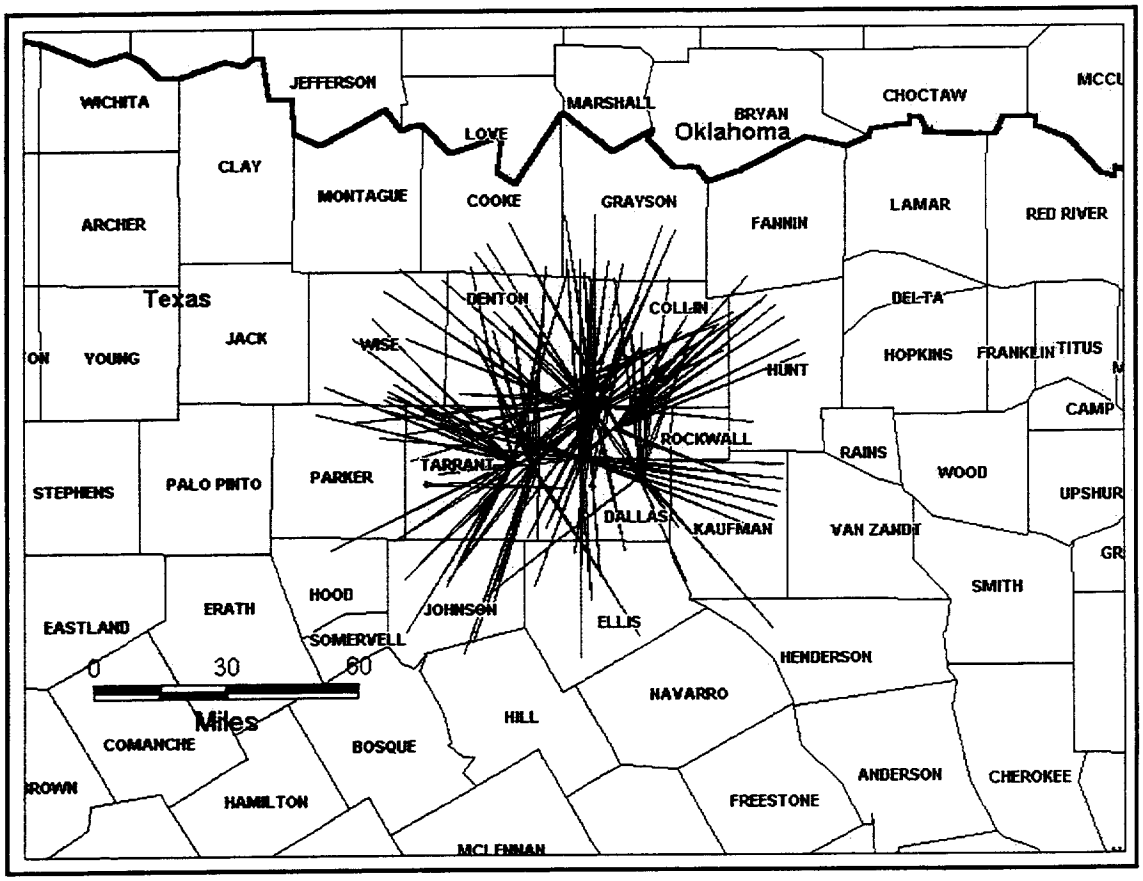
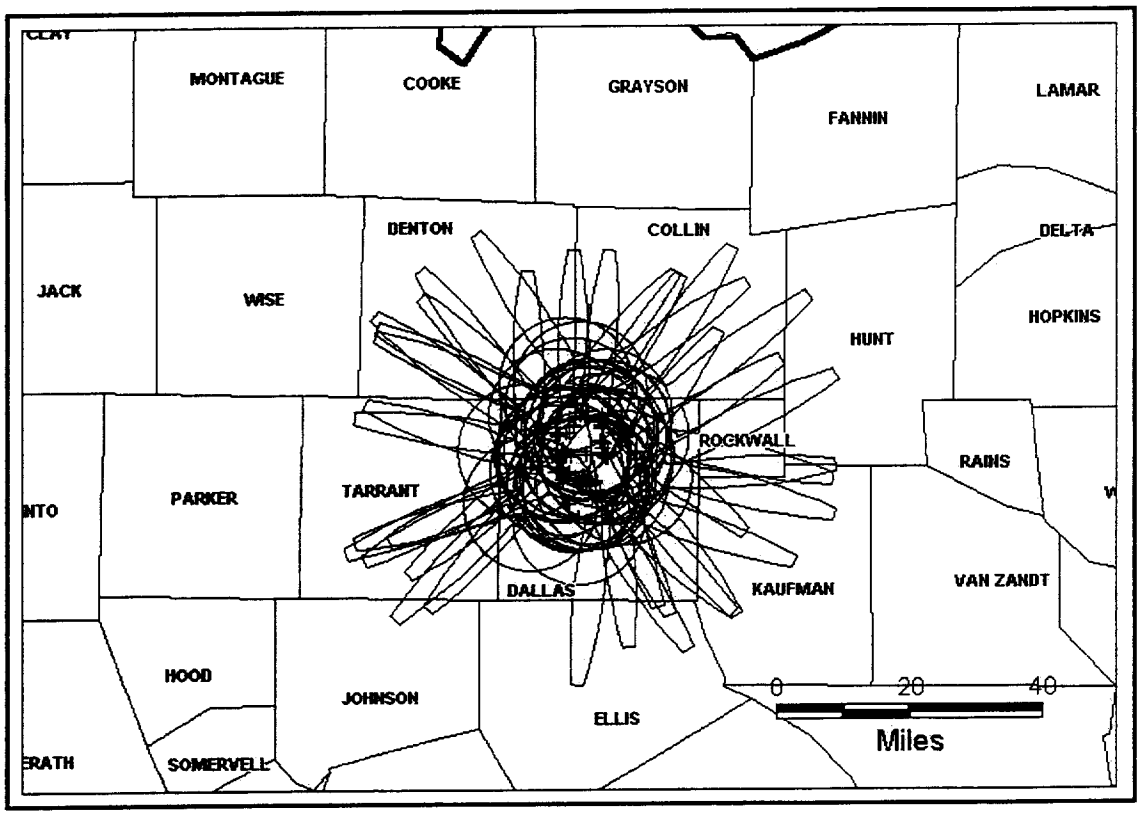


Exhibit 2


MONTAGUE
COOKE
GRAYSON
FANNIN
LAMAR
DENTON
COLLIN
DELTA
JACK
WISE
HUNT
HOPKINS
ROCKWALL
RAINS
PARKER
TARRANT
DALLAS
KAUFMAN
VAN ZANDT
HOOD
JOHNSON
ELLIS
SOMERVELL
0
20
40
Miles